

**UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

**The Boeing Company**

**Regulatory Docket No. 29203**

for exemption from §§ 25.783(h),  
25.807(d)(1), 25.810(a)(1), 25.812(e),  
25.819(a), 25.857(e), and 25.1447(c)(1), of  
Title 14, Code of Federal Regulations.

**PARTIAL GRANT OF EXEMPTION**

By letter dated April 2, 1998, Mr. Walt Smith, Manager, MD-17 Airworthiness, The Boeing Company, 2401 E. Wardlow Rd., Long Beach, CA 90807-5309, petitioned the FAA for exemption from the requirements of the following sections of Title 14, Code of Federal Regulations (14 CFR): §§ 25.783(h), 25.807(d)(1), 25.810(a)(1), 25.812(e), 25.819(a), 25.857(e), and 25.1447(c)(1), on MD-17 freighter airplane with a Class E cargo compartment, and added accommodations for up to two supernumeraries, for a maximum airplane occupancy of six.

**The petitioner requests relief from the following regulations:**

Section 25.783(h), as amended by Amendment 25-72, requires that each passenger entry door in the side of the fuselage must qualify as a Type A, Type I, or Type II passenger emergency exit, and must meet the requirements of §§ 25.807 through 25.813 that apply to that type of passenger emergency exit.

Section 25.807(d)(1), as amended by Amendment 25-72, requires in pertinent part that the minimum number and type of passenger emergency exits for 1 through 9 passengers is one Type IV exit on each side of the fuselage.

Section 25.810(a)(1), as amended by Amendment 25-72, requires in pertinent part that each non over-wing emergency exit more than 6 feet from the ground with the airplane on the ground and the landing gear extended must have an approved means to assist the occupants in descending to the ground. The assist means must be a self-supporting slide or equivalent, of certain prescribed characteristics.

Section 25.812(e), as amended by Amendment 25-58, requires in pertinent part that floor proximity emergency escape path marking must provide emergency evacuation guidance for passengers when all sources of illumination more than 4 feet above the cabin aisle floor are totally obscured. In the dark of night, the floor proximity emergency escape path marking must enable each passenger to visually identify the escape path to the exits available, and readily identify each exit from the escape path solely by reference to the required markings.

Section 25.819(a), as amended by Amendment 25-53, requires in pertinent part that for airplanes with a service compartment located below the main deck, which may be occupied during taxi or flight but not during takeoff or landing, there must be at least two emergency evacuation routes of certain prescribed characteristics.

Section 25.857(e), as amended by Amendment 25-60, specifies that a Class E cargo compartment is one on airplanes used only for the carriage of cargo [i.e., no passengers permitted], and has certain prescribed characteristics.

Section 25.1447(c)(1), as amended by Amendment 25-41, requires in pertinent part that if certification for operation above 30,000 feet is requested, that an oxygen dispensing unit [mask] must be immediately available to each occupant wherever seated, and must be automatically presented to the occupants before the cabin pressure altitude exceeds 15,000 feet, and the crew must be provided with a manual means to make the dispensing units immediately available in the event of the failure of the automatic system. The total number of dispensing units must exceed the number of seats by 10 percent, with the extra units uniformly distributed throughout the cabin.

#### **Related Sections of the Federal Aviation Regulations (FAR):**

Title 14 CFR § 25.807, in pertinent part, defines the minimum sizes and other attributes of the various emergency exit Types, prescribes ditching exit requirements, and establishes the minimum acceptable emergency exit configurations for given passenger occupancies.

Title 14 CFR § 25.809 prescribes certain general attributes that each Type of emergency exit must have, including means of opening and provisions against jamming.

Title 14 CFR § 25.811 requires, in pertinent part, emergency exits to be marked, their locations identified, and their means of operation displayed.

Title 14 CFR § 25.812 requires an emergency lighting system of certain attributes.

Title 14 CFR § 25.813 prescribes the access that is required to Types of emergency exits.

Title 14 CFR § 121.583 provides, in pertinent part, that when authorized, certain persons other than passengers may be carried aboard an airplane not in compliance with certain passenger-carrying requirements including those described in §§ 121.310 and 121.317.

**The petitioner's supportive information is as follows:**

The Boeing Company, manufacturer of the Model MD-17 freighter aircraft, hereby petitions for exemption from the requirements of §§ 25.783(h), 25.807(d)(1), 25.810(a)(1), 25.812(e), 25.819(a), 25.857(e), and 25.1447(c)(1) for MD-17 airplanes with a Class E cargo compartment, to permit the installation of accommodations for up to two supernumerary occupants on the flight deck, for a total occupancy of six.

“Nature and extent of relief sought:

“The purpose of this petition for exemption is to permit carriage of supernumeraries on an all-freighter airplane, which is the direct reason for requesting exemption from § 25.857(e). Other sections from which exemption is sought are subordinate to this one.

“Exemption from the aforesaid sections is sought to the following extent:”

Section 25.783(h): The entry door is on the main deck, and will not be designated as an emergency exit due to its remote location from the flight deck and due to the fact that the MD-17 airplane does not provide protection to this door in the event of the cargo shifting forward in an emergency landing.

“Section 25.807(d)(1): The MD-17 is a high-wing cargo airplane with no overwing exits or passenger emergency exits on the main deck. The designated emergency exits are the cockpit windows and the overhead hatch in the flight deck compartment.

“Section 25.810(a)(1): The emergency evacuation assist means are individual descent devices installed at the cockpit windows and the overhead hatch.

“Section 25.812(e): Relief is sought from the requirement for floor proximity emergency escape path marking.

“Section 25.819(a): The main deck of the MD-17 is for cargo, and is not considered a service compartment; and therefore, this regulation should not apply to the MD-17 airplane.”

Section 25.857(e): Relief is sought to permit the accommodation of up to two supernumeraries on the flight deck.

“Section 25.1447(c)(1): One oxygen-dispensing unit is supplied and readily available for every seated occupant on the flight deck. The occupants will take hold of the mask upon instruction via lighted signs and horn. These signs and horn are either automatically activated by an altitude-sensing aneroid switch or can be activated manually by the cockpit crew.

“Description of the aircraft covered:

“The MD-17 airplane is an all-cargo airplane designed to carry outsized and special cargo into short and/or austere fields, and to provide special cargo delivery capabilities not available with any other airplane type certified by the FAA. The MD-17 is a pressurized, transport category airplane powered by four turbofan engines, and will have a Class E main deck cargo compartment configuration.

“The MD-17 has seats for a maximum of six occupants (two flight crewmembers, one additional crew member, one FAA inspector seat (right-hand side additional crewmember seat) and up to two supernumeraries) seated in the flightcrew compartment.

“In order to optimize cargo missions, two courier seats are provided on the flight deck behind the flightcrew in the direct vicinity of the exits. These seats have ready access to the cockpit windows and the overhead hatch for emergency egress. Except for the sections from which exemption is requested, all part 25 passenger safety requirements applicable to the carriage of passengers have been taken into account during the design of these accommodations. In particular, protection from crash injury and from the penetration of smoke and noxious gases is provided by a smoke-tight curtain which isolates the main-deck cargo compartment from the flight deck where the supernumeraries are seated.

“Three exits for emergency egress are available and accessible to each of the six (maximum) occupants. One emergency exit is located on each side of the fuselage (cockpit window), and an overhead hatch emergency exit is located in the flight deck compartment. All three exits are fitted with descent devices in lieu of the ropes allowed by the regulations [for flightcrew only]. Oxygen supply in case of depressurization (as

required in case of smoke warning in the main deck cargo compartment) is ensured by fixed oxygen bottles, which can supply oxygen for all occupants when on the flight deck and/or the courier seats. The occupants are notified that oxygen masks need to be used by a continuous horn and lighted signs located in their direct eye scan. These warning features (horn and lighted signs) can be either manually activated by the flightcrew members or automatically turned on by an altitude pressure switch. The masks are of the quick-donning, full-face type similar to the cockpit masks. The oxygen system for the courier seating is plumbed into the cockpit system. . . . Drop-out masks, similar to those for passengers on passenger flights are provided in the crew rest area bunks, lavatory, and loadmaster seat. They function in the same manner as the passenger masks. In addition, in accordance with the requirements of § 121.337, a Personal Breathing Equipment (PBE) unit will be installed in the vicinity of the crew bunks.

“Two-way communications with the cockpit is possible through dedicated communications panels, and other emergency equipment required by the applicable airworthiness standards is also provided. The Boeing Company believes that, for the parts of the requirements for which relief is sought, an equivalent level of safety will be achieved by design precautions and by introduction of instructions in the MD-17 Type Certificate Data Sheet (TCDS) defining the conditions under which supernumerary persons may be carried (reference § 121.583(a)).

“Information provided in support of petition:

“Supporting arguments:

“1. Cargo operators need a number of support personnel for safe handling of cargo in the process of loading/offloading. These personnel are necessary both at departure and at arrival of a cargo flight. It is particularly important that the cargo handlers are present upon airplane arrival if perishable goods, heavy outsized equipment, or live animals are carried. The most efficient, surest, and most cost-effective way to assure their presence at destination airports is to transport them aboard the cargo flight.

“2. Among their various missions, the cargo operator may have to carry goods such as live animals, hazardous materials, and valuable or perishable cargo. These types of cargo cannot be left unattended, even for the duration of a flight, and the presence of personnel qualified in their handling is necessary on the airplane on which they are carried. Safety and efficiency of the operation will therefore be enhanced.

“3. Cargo Operators also need to have qualified cargo loading/unloading personnel for operation and maintenance purposes at various locations. Operators would optimize their missions by carrying personnel aboard cargo flights.

“4. The airworthiness standards applicable to the type certificate of the MD-17, as well as the current airworthiness standards, address the carriage, aboard commercial flights, of only the following types of occupants:

“Crew members, including flightcrew members and cabin attendants, who are each assigned duties associated with the operation of the airplane and;

“Passengers, who have no expected ability in the use of emergency provisions, and therefore need to be attended.

“The category of occupant for which this exemption is sought is that of ‘supernumerary,’ i.e., qualified, trained personnel.” A review of prior certification data shows that the FAA has granted a number of exemptions from the requirements of § 25.857(e) (which would otherwise prohibit the installation of accommodations for persons other than flightcrew members aboard airplanes having a Class E cargo compartment), when such persons are considered to be a special kind of passenger called supernumeraries. “It has been recognized that supernumeraries do hold a special status by virtue of specific knowledge and abilities attributed to them through selection and mandatory training.”

The MD-17 supernumeraries will be briefed in the autonomous use of emergency equipment and emergency exit operation. Operators will be required to allow supernumerary occupancy only to persons found able to perform these tasks unassisted.

“Training requirements for persons who will be carried as supernumeraries will be provided in the limitations section of the Airplane Flight Manual (AFM). The AFM list will be consistent with the list of persons allowed during part 121 operations, by § 121.583(a).

“The desired end result is the retention of all passenger safety features to the maximum extent reasonable, when all factors are considered, and an overall level of safety for supernumeraries is comparable to that afforded to passengers.

“The requirement of § 25.783(h) for passenger entry doors in the side of the fuselage does not apply to the MD-17 entry door since the passenger entry door for the MD-17 airplane is located in the main deck. The entry door is not designated as an emergency exit due to its remote location from the flight deck, and the fact that it is not protected from cargo shifting forward in an emergency landing event.

“The requirement of § 25.1447(c)(1) for oxygen dispensing units to be automatically presented before cabin pressure altitude exceeds 15,000 feet is mitigated by the supernumeraries having knowledge of equipment location and use. The masks provided are quick-donning masks with regulators, and are immediately available to seated occupants in a similar manner as for flightcrew members. In addition, there will be a

lighted sign instructing occupants to don oxygen masks, and a warning horn will sound prior to the cabin pressure altitude exceeding 15,000 feet. As for the requirement of § 25.1447(c)(1) for a ten-percent excess quantity of dispensing units, this is mainly required for two purposes: for cabin attendants moving along the aisles, and for infants held in laps.” Neither of these situations exist in the proposed configuration; however, the ten-percent requirement will be met in locations where masks are automatically presented to occupants of bunks, the lavatory, and the loadmaster seat.

“The requirement of § 25.807(d)(1) for a minimum of a Type IV exit on each side of the fuselage is met by utilizing the cockpit windows on each side of the flight deck, which are larger than Type IV exits. In addition, the MD-17 has an overhead hatch in the flight deck compartment which can also be used for emergency escape from the flight deck. Since all persons (flightcrew and supernumeraries) will be knowledgeable, trained personnel, the operation of the emergency exits will pose no difficulties, and as a result, a level of safety greater than that required by § 25.807(d)(1) will be achieved.

“The requirement of § 25.810(a)(1) for a self-supporting slide or equivalent for each passenger emergency exit cannot be met for the MD-17 airplane. There are no designated emergency exits on the main cargo deck, nor are there any occupiable seats on the cargo deck for taxiing, takeoff, and landing. The two cockpit windows, one on each side of the fuselage, and the overhead hatch located within the flight deck area, are all fitted with descent devices that replace the ropes allowed by § 25.810(a)(2) [for flightcrew only] for escape from the flight deck. Each cockpit window will be fitted with three descent devices, each long enough to reach the ground when deployed from the opposite window. The overhead hatch will be fitted with six descent devices, one for each occupant. The overhead hatch can be opened from both the inside and the outside of the aircraft. The cockpit windows can be opened from the inside. The use of the descent devices to provide a safe, rapid means of escape will be demonstrated during the certification process for the MD-17 airplane. Equivalency to the requirements of § 25.810(a)(1) is shown by the use of the descent devices from the flight deck.

“Section 25.812(e): The main deck (cabin floor) is the cargo deck on the MD-17 aircraft.” The flight deck is the deck where all occupants will be seated. The flightcrews and supernumeraries are not allowed to enter the main deck during emergency egress. The occupants will exit from either the cockpit windows or the emergency escape hatch. “The pathway to each of the designated exits is marked by visual features not more than four feet off the flight deck floor. Occupants in the flight deck during emergency situations can readily identify passageways to the nearest emergency exits. The training that the supernumeraries receive will familiarize them with the flight deck arrangement and enable rapid egress. During instances when smoke is produced in the flight deck, the

air distribution system will minimize the obscuring effects of smoke by rapidly evacuating smoke through floor-level vents strategically installed in the area. Therefore, the MD-17 provides an acceptable level of safety for supernumerary evacuees.”

“When proceeding to the cockpit windows from the supernumerary seats, a stooping or crawling occupant can readily identify the threshold formed by the left and right electrical power centers. Once the occupant has passed through the threshold, the Additional Crew Member (ACM) seats are within three feet to either side, and the center pedestal control panel is within five feet straight ahead. In either case, the distance is not greater than the aisle-to-exit distance on a typical passenger airliner. After the occupant has reached the ACM seats, he/she must stand up to fasten the descent device prior to exiting the aircraft. The lower edge of the window frame is less than three feet from the floor, and is readily identifiable. Ceiling-mounted emergency floodlights are provided in these areas to aid in egress.” The MD-17 cockpit is similar to that of FAA-approved DC-10 and MD-11 freighter airplane.

“When proceeding to the escape hatch from the supernumerary seats, a stooping or crawling occupant can readily identify a foot rung located 15 inches above the floor, directly below the bunk access to the hatch. Once the rung is identified, the occupant must stand up to lift the hinged panel of the upper bunk and open the catwalk-access door which is illuminated by an emergency floodlight. The occupant must then climb to the catwalk that leads to the escape hatch. Ceiling emergency floodlights are provided in these areas to aid in egress.” An illuminated exit sign is also installed at the end of the catwalk, which also provides floodlighting for the hatch above.

“The requirements of § 25.819(a) for two escape routes to the emergency exits from a lower deck service compartment are not appropriate for the MD-17 airplane. Boeing does not believe that § 25.819(a) applies to the MD-17. However, the following features will be provided on the MD-17. The lower deck (main deck) is the cargo deck on the MD-17 airplane. No services are performed on this deck, as all required operational services, with the exception of a lavatory and a small crew galley, are located on the upper, flight deck of the airplane.” During flight, due to the limited number of people on the airplane, it is anticipated that no more than one person would be on the cargo deck at any one time, and nobody will be on the main deck during taxi, take-off, or landing. For the above reasons, the requirements of § 25.819(a) should not be considered applicable to the MD-17 airplane.

“Actions to be taken by Boeing to provide an equivalent level of safety:”

In order to ensure compliance with the conditions provided in support of this exemption, Boeing proposes to include the following instructions in the TCDS for the MD-17:

“1. Occupancy is restricted to a maximum of six people, including flightcrew members.



“2. Occupants are limited to the categories specified in § 121.583(a)(1) through (7).

“3. The operator must determine that each occupant has the demonstrated physical ability to autonomously use the emergency provisions.

“4. Each occupant must be instructed by the operator, in accordance with FAA-approved procedures, on the autonomous use of the emergency provisions, and be verbally briefed before each takeoff by an appropriate crewmember as to the location and use of the emergency exits and emergency equipment.

“Reasons why granting an exemption is in the public interest, and will not adversely affect public safety:

“The MD-17 is a commercial derivative of the U.S. Air Force C-17A.” The fleet of 37 C-17A aircraft has accumulated in excess of 70,000 flight-hours, with an excellent safety record. The introduction of the MD-17, with its capability for carrying heavy and outsized cargo, and its unique short-field performance, will greatly benefit the public. Today, the airlift of heavy and outsized cargo by freight forwarders and operators requires the use of foreign-registered aircraft not type certified to FAA safety standards. “In fact, the safety and reliability record of one of the competitor aircraft is particularly poor, and it has been grounded several times.” As an aircraft type certificated by the FAA, the MD-17 will provide a safer alternative.

“The economic benefits associated with the production of the MD-17 are also in the best interest of the public.” The acquisition cost of the C-17A to the U.S. government would be reduced, because of the economic advantage of a production quantity increase of the C-17A aircraft. “Improvements in overhead cost distribution and the production learning curve distribution are directly affected by introduction of the MD-17 into the production line. Furthermore, the MD-17 is designed for maximum commonality with the C-17A, and will enhance the Civil Reserve Aircraft Fleet (CRAF) potential at a lower cost to the U.S. government.”

Granting an exemption so that the MD-17 can be introduced will benefit the public by allowing the introduction of a safe alternative for air transport of heavy/outsized equipment serving two to three times as many airports as the existing freighter aircraft, and will reduce acquisition costs (taxpayer burden) of the C-17.

“Additionally, domestic air carriers operating the MD-17 will increase revenue for the U.S., and will potentially establish early-entrant dominance in the emerging heavy/outsized cargo air transport industry. While the MD-17 remains unmatched in capability, this early-entrant advantage will enable the U.S. industry to better preempt the current and future entrants, e.g., the Russian AN-124, the Airbus Beluga, the Il-76, and the AN-70.

“Granting the exemption will be in the public interest, since by carrying supernumerary persons aboard their cargo flights, operators of the MD-17 freighter airplanes (operating under U.S. regulations) will operate under optimal safety conditions, will render their operation more efficient, and will realize substantial savings in transporting their personnel.”

A summary of Boeing’s petition was published in the Federal Register on June 10, 1998 (63 FR 31826). No comments were received.

**The FAA's analysis/summary is as follows:**

Title 14 CFR § 11.25 contains the provisions and requirements associated with the submittal and review of petitions for exemption. Among other requirements, a petitioner must address the potential adverse impact on safety that the proposed non-compliant configuration may represent, or what other means are provided which result in an equivalent level of safety to that ensured by the regulations from which exemption is sought. Additionally, the petitioner is to show the reason why the proposed non-compliant configuration, with any attendant potential for a reduced level of safety, is compensated for by being in the public interest. In all cases, the FAA expects and shall require as conditions of any grant of exemption the retention of all passenger safety features to the maximum extent practicable. The following FAA responses are generally in order of importance to the petitioner’s proposed configuration.

Section 25.857(e): Part 121 of the Federal Aviation Regulations (FAR), e.g., § 121.583, recognizes a "person" category of occupant, as distinct from "passenger" or "crew" occupants addressed in part 25, and allows non-compliance, for operational purposes only, with certain part 121 requirements normally pertinent to passenger-carrying airplanes, passenger-carrying operations, and passenger requirements. These "persons" are commonly referred to as supernumeraries. Supernumeraries are a special class of occupant which, by virtue of certain knowledge and abilities attributed through selection and mandatory training, has enhanced capabilities over those which can be expected of passengers.

Part 25 type design requirements must be observed in modifying transport category airplanes for the accommodation of supernumerary or any other occupants, regardless of

any part 121 provisions allowing operations. But part 25 contains no provisions for “persons” or “supernumeraries.” As indicated above, part 25 addresses only “passenger” or “crew” occupants. In order to address this anomaly, the FAA has determined that for the purposes of applying appropriate type design requirements for added supernumerary accommodations, supernumeraries are to be considered by default as passengers. Accordingly, in proposed configurations which include added supernumerary accommodations which are inconsistent with part 25 passenger safety requirements, the FAA would otherwise consider those to be unacceptable. The FAA acknowledges the noted enhanced capabilities of supernumeraries, however, and is willing to entertain petitions for exemption from those requirements.

The FAA favorably considers the petitioner’s arguments presented in its petition for exemption from the general requirements of § 25.857(e) in this regard, which prohibit a Class E cargo compartment in an airplane configured for anything other than the carriage of cargo. Attention is drawn, however, to the petitioner’s statements that hazardous cargo cannot be left unattended, even for the duration of a flight, as one justification for permitting supernumeraries onboard such flights. Without making any determinations as to the accuracy of this claim, the FAA advises in this regard that the carriage of hazardous cargo is governed by the operational and security requirements of 49 CFR part 175. Accordingly, and in view of the fact that the proposed supernumeraries are not being accommodated in the same compartment as any hazardous cargo, the FAA’s Transport Airplane Directorate (TAD) makes no determination with regard to the acceptability of carrying supernumeraries on flights with hazardous cargo onboard. The TAD does, however, as a reasonable precaution, recommend that the potential for exposure to hazardous materials be minimized to the maximum extent practicable, by reducing supernumerary occupancies on such flights to the minimum number absolutely required for safety of flight.

The concern noted immediately above is alleviated somewhat by a condition of this exemption that access to the Class E cargo compartment shall be prohibited, by suitable and prominent placarding, during flight operations. There is a potential that this prohibition may be lifted at such time that the petitioner elects to submit a further petition in accordance with the provisions of part 11 which satisfactorily addresses the obvious occupant safety issues such as supplemental oxygen and two-way voice communications while in the remote compartment. The current petition did not include any discussion of these subjects.

Section 25.807(d)(1): To date, the FAA has processed, generally favorably, a number of petitions for exemption associated with the installation of accommodations for supernumerary occupants on airplanes with Class E cargo compartments. In the vast majority of those cases, those accommodations have been in the forward portion of single-deck airplanes which have been converted from the carriage of passengers to the carriage of cargo only. In all of those conversions except one, all adjacent passenger emergency exits, with associated passenger escape means (slides), have been retained from the original passenger configuration. The single exception among the conversions is a 767-200 passenger airplane modified as a cargo airplane by another petitioner. As a part of that configuration, the R1 emergency exit was rendered unusable by a unique cargo retention system. It was only after an extensive and lengthy review of additional data that the petitioner successfully persuaded the FAA to grant their petition for exemption in this regard. The Boeing Models 757-200PF and 767-300F, being originally built as cargo airplanes instead of retroactively converted from passenger configurations, lack a passenger emergency exit where the R1 passenger emergency exit is normally located on the comparable passenger version of these airplanes. The interior space on those airplanes that would otherwise have been dedicated to accommodating an R1 door, and the required access to that door, was instead utilized to accommodate additional cargo, baggage, or other features. Boeing was able to satisfactorily substantiate to the FAA that the increased utility and/or cargo-carrying capability of these airplanes, which was made feasible only by the elimination of the R1 exit, was in the public interest. In the context of this background, the extant petition is evaluated.

For the passenger occupancy proposed in this MD-17 configuration, § 25.807 requires a minimum of a Type IV emergency exit in each side of the fuselage. A Type IV exit is a minimum of 19" x 26" in size, is located over the wing, and has an inside step-up not to exceed 29 inches and an outside step-down not to exceed 36 inches. In the extant petition, Boeing is proposing that in lieu of these required Type IV emergency exits--with their associated ease of egress and descent to the ground from the airplane--the cockpit windows and a centrally located overhead hatch be accepted when inertia reels (discussed below, under § 25.810(a)(1)) are provided for each occupant to descend to the ground. In reviewing this proposal, it is noted that Boeing has chosen to omit information in this petition that the FAA has previously indicated to Boeing is extremely relevant in this matter: the availability of an existing floor-level exit on each side of the fuselage, accessible on the main cargo deck via a stairway. Except in certain limited circumstances, the FAA considers these main-deck floor-level exits, with thresholds only a relatively short distance from the ground, to offer the most intuitive, expeditious, and safest means of egress from the airplane, for both ambulatory and incapacitated occupants. Accordingly, Boeing's petition in this regard is denied.

As an associated consequence of this denial, it should be understood that, in designating these two exits as required emergency exits, all pertinent marking, lighting, and access requirements of §§ 25.811, 25.812, and 25.813, respectively, shall apply--except as follows: The FAA considers that full compliance with the access requirements of § 25.813 would likely require a complete redesign of the existing cargo restraint system, in order to maintain full access dimensions following a forward 9g crash event, and may likely represent a considerable hardship to the petitioner at this point. Accordingly, in consideration of acceptable secondary egress options in the cockpit area, and in view of the fact that emergency evacuations may also be prompted by other than “crash” events, or minor crash events where access may be restricted but still usable, Boeing shall be exempt from substantiating that the required access be retained subsequent to a 9g crash event.

Section 25.783(h): See related discussion immediately above. Boeing’s petition for exemption from this requirement is denied, for the reasons given, except as indicated above with regard to associated 9g post-crash access requirements.

Section 25.812(e): See related discussion above. Boeing’s petition for exemption from this requirement relative to the cockpit is granted, but is denied relative to the required main-deck emergency exits.

Sections 25.810(a)(1) & 25.810(a)(2): Given the denial, above, of the petition for exemption from the passenger emergency exit requirements of §§ 25.783(h) and 25.807(d)(1), the petition for exemption from the escape slide requirements of § 25.810(a)(1) relative to the cockpit exits, is moot. Denial of those petitions results in main-deck emergency exits that have sill heights considerably below the 6-foot criteria which would have triggered the requirement to comply with § 25.810(a)(1).

The FAA considers retention of the petitioner’s intended inertia reels for each occupant at the two cockpit windows and at the overhead hatch to be an essential and required feature of the interior configuration of the MD-17 airplane. The primary reason for this is that, under some circumstances, cargo may shift into what would otherwise be a required access width to the floor-level passenger emergency exits. Accordingly, and in view of recent demonstrations which have indicated to the FAA that the ropes explicitly permitted by § 25.810(a)(2) at cockpit windows may be unsafe from the sill heights of some modern airplanes, the FAA considers the indicated proposals of the petitioner in this regard as actually a petition for exemption from the flight deck rope egress requirements of § 25.810(a)(2). The FAA grants the petitioner’s request in this regard, assuming the successful accomplishment of demonstrations to the FAA of these devices.

Section 25.1447(c)(1): The FAA concurs with the petitioner's arguments concerning requirements for automatic presentation of oxygen masks at the supernumeraries' seating location, and for the uniformly located 10-percent overage requirement for masks in that seating area. Accordingly, exemption is granted from those requirements as petitioned.

It is unclear, however, that the petitioner is aware of other requirements associated with providing supplemental oxygen for the proposed supernumeraries. These concerns are discussed below:

(1) The requirement for supplemental oxygen is generally intended to address a decompression event caused by structural or systems failure. The supply of supplemental oxygen in this scenario need only be appropriate to an expeditious descent. On passenger airplanes, this requirement is typically fulfilled satisfactorily with oxygen-generating canisters of very limited duration. On cargo airplanes with Class E cargo compartments, however, there is an additional, more demanding scenario in which supplemental oxygen must be provided. The certification requirements of Class E cargo compartments are predicated upon implementation of cabin decompression procedures required by § 25.857(e)(3) to control a fire until a landing can be effected. These procedures (which must be defined in an FAA-approved AFM for the MD-17) typically specify maintaining a cabin altitude of approximately 25,000 feet while heading to an emergency landing site. The quantity of supplemental oxygen required during the entirety of this event, for all occupants, would necessarily be greater than would otherwise be the case for "normal" compliance with § 25.1447. The petitioner must substantiate adequate supplemental oxygen for this scenario.

(2) Although the petitioner has not requested exemption from the requirements of § 25.1445(a), nor is one granted herein, it is noted that the petitioner nevertheless superfluously describes a distribution system for supplemental oxygen which provides a common supply for all occupants, with no means proposed to separate the supply between flight crewmembers and supernumerary occupants. Given that the intent of the noted requirements is to ensure that an adequate supply of oxygen is prioritized for flight crewmembers, there is a perception that this proposal may violate those requirements. Accordingly, the petitioner shall substantiate to the satisfaction of the FAA that compliance with these requirements has been shown for the MD-17.

(3) In granting exemption from the requirement of § 25.1447(c)(1) to the extent necessary to permit the installation of flightcrew-type quick-donning masks, the FAA is not granting exemption from the associated requirement for automatic presentation with manual backup. In other words, while permitting flightcrew-type masks in lieu of automatically presented masks, the FAA shall require automatic presentation, with

manual backup, of the means for notifying of the need for supplemental oxygen, in the form of the proposed lighted signs and horn. This clarification is considered necessary in view of the petitioner's stated intent to provide automatic "or" manual presentation of the means of notification.

Section 25.819(a): Without necessarily concurring with the rationale provided by the petitioner in this matter, the FAA is inclined to apply this requirement primarily to configurations where an occupant or occupants may become otherwise irretrievably trapped, such as in lower-lobe galleys or in remote, above-deck crew-rest facilities. Additionally, there have been precedent-setting Boeing 747 cargo configurations that have been FAA approved, without adverse service history, in which there has been only a single ladder access between the lower and upper decks. In the proposed MD-17 configuration, as in the 747 configurations noted, there is external emergency exit access on both the upper and lower decks in the unlikely event that internal ladder access between the decks becomes impassable in flight. Accordingly, this petition for exemption is granted.

Finally, in reviewing the petition, the FAA notes the petitioner's statement that, 'all part 25 passenger safety requirements applicable to the carriage of passengers *have been taken into account* (emphasis added). The FAA considers this statement to be somewhat less definitive than one declaring compliance with all pertinent sections of the FAR pertaining to the carriage of passengers. Accordingly, this partial grant of exemption shall be understood to address only the specific sections from which exemption is sought, and necessarily assumes that all other pertinent passenger safety requirements of part 25 will be complied with to the satisfaction of the cognizant FAA Aircraft Certification Office (ACO).

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and is determined to not have an adverse effect on the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), Boeing's petition for exemption is granted from:

- (1) The means of emergency egress requirements of § 25.810(a)(2) for flight-deck exits, on the condition that inertia reel devices are satisfactorily demonstrated to the FAA.
- (2) The floor proximity escape path marking requirements of § 25.812(e) to the flight deck exits, but not to the main-deck exits.

- (3) The main-deck emergency exit passageway-width requirements of § 25.813(a), for a post-crash 9g condition only.
- (4) The evacuation route requirements of § 25.819(a).
- (5) The Class E cargo compartment requirements of § 25.857(e), on the condition that access to the Class E compartment during flight operations is prohibited by placarding.
- (6) The requirements of § 25.1447(c)(1) relative to automatically presented masks, and to uniformly distributed extra masks, on the condition that there is an automatic means of notification, with manual backup.

With regard to Boeing's petition for exemption from certain emergency exit requirements, I find that a grant of exemption is not in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), Boeing's petition for exemption from the emergency exit requirements of §§ 25.783(h) and 25.807(d)(1) is hereby denied.

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